Abstract:

Introduction Impact of in utero exposure to nicotine, on the structure of the thyroid-pituitary axis and the parathyroid glands have been examined in 1-month-old rats and compared with that of thiocyanate. Materials and Methods Three pregnant female groups were used; control, nicotine and thiocyanate. Treatment started from gestation day (4–20) and the specimens were harvested from the male offspring of all groups at the age of 1 month and processed for light, electronmicroscopic and immunohistochemical examination. Total triiodothyronine (T3), total thyroxine (T4) and total thyrotropin (TSH) were quantitatively determined in serum. Results Both nicotine and thiocyanate activated the thyroid follicular cells, with an increase in height (about 30 %) and a negative feedback on the pituitary thyrotrophs which revealed a reduction in the number of cytoplasmic secretory granules, particularly the thiocyanate group. However, in thiocyanate group there was signs of impaired secretory activity of the thyroid gland. The arbitrary area of parathyroid chief cells, increased (about 45 %) particularly in nicotine group, with signs of reduced activity and a positive feedback on the parafollicular cells which revealed hypertrophy, proliferation (25 %) and increased intensity of positive immunohistochemical reaction for calcitonin. Conclusion Nicotine impaired chief parathyroid cells activity and consequently activated parafollicular cells. Thiocyanate reduced pituitary thyrotrophs activity whereas both nicotine and thiocyanate increased thyroid follicular cells activity. This impact of in utero exposure persisted for 1-month postnatal.

Keywords:

Nicotine/thiocyanate · In utero exposure · Pituitary-thyroid axis

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